

SEQUENCE LISTING

<110> Booth, Russ
 Cahoon, Rebecca E
 Hitz, William D
 Kinney, Anthony
 Yadav, Naren

<120> Nucleotide Sequences of a New Class of Diverged Delta-9 Stearoyl-ACP Desaturase

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 Glu Gly Leu Met ala Glu Gly Lys Arg Ala Gln Asp Phe Val Cys Gly
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 35 40 45
 Cys Arg Ser Ser His Ser Ser Thr Gly Thr Thr Thr Met ala Val Pro
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 Val Leu Lys Arg Arg Glu Lys Gln Asp Glu Xaa Gln Glu Trp Met Gly
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Glu Lys Ala Glu Val Phe Arg Ser Leu Glu Gly Trp Ala Ala Arg Ser
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Leu Leu Pro Leu Leu Lys Pro Val Glu Glu Cys Trp Gln Pro Ala Asp
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Phe Leu Pro Asp Ser Ser Ser Glu Met Phe Gly His Glu Val Arg Glu
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Ile Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala Ser Asn Cys
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Pro Trp Ala Val Trp Thr Arg Ala Trp Thr Ala Glu Glu Asn Arg His
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Gly Asp Ile Leu Gly Lys Tyr Met Tyr Leu Ser Gly Arg Val Asp Met
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Arg Met Val Glu Lys Thr Val Gln Tyr Leu Ile Gly Ser Gly Met Asp
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Pro Gly Thr Glu Asn Asn Pro Tyr Leu Gly Phe Val Tyr Thr Ser Phe
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Gln Glu Arg Ala Thr Ala Val Ser His Gly Asn Thr Ala Arg Leu Pro
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 His Gly Asn Thr Ala Arg Leu Val Gly Ala Arg Gly His Gly Asp Ala
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 Ala Leu Ala Arg Val Cys Gly Thr Val Ala Ala Asp Glu Lys Arg His
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Pro	Trp	Ala	Val	Trp	Thr	Arg	Ala	Trp	Thr	Ala	Glu	Glu	Asn	Arg	His	145	150	155	
Gly	Asp	Ile	Leu	Gly	Lys	Tyr	Met	Tyr	Leu	Ser	Gly	Arg	Val	Asp	Met	165	170	175	
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Asp Met Asp Leu Phe Glu His Phe Ala Ala Val Ala Gln Arg Leu Gly
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Val Tyr Thr Ala Arg Asp Tyr Ala Asp Ile Val Glu Phe Leu Val Lys
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Arg Trp Lys Leu Glu Thr Leu Glu Ser Gly Leu Ser Gly Glu Gly Arg
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Arg Ala Arg Asp Phe Val Cys Gly Leu Ala Pro Arg Met Arg Arg Ala
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 <212> PRT
 <213> Oryza sativa

<400> 14
 Tyr Leu Ser Gly Arg Phe Asp Met Ala Glu Val Glu Arg Ala Val His
 1 5 10 15

Arg Leu Ile Arg Ser Gly Met Ala Val Asp Pro Pro Cys Ser Pro Tyr
 20 25 30

His Ala Phe Val Tyr Thr Ala Phe Gln Glu Arg Ala Thr Ala Val Ala
 35 40 45

His	Gly	Asn	Thr	Ala	Arg	Leu	Val	Gly	Ala	Arg	Gly	His	Gly	Asp	Ala
50						55				60					
Ala	Leu	Ala	Arg	Val	Cys	Gly	Thr	Val	Ala	Ala	Asp	Glu	Lys	Arg	His
65				70				75						80	
Glu	Ala	Ala	Tyr	Thr	Arg	Ile	Val	Ser	Arg	Leu	Leu	Glu	Ala	Asp	Pro
				85				90						95	
Asp	Ala	Gly	Val	Arg	Ala	Val	Ala	Arg	Met	Leu	Arg	Arg	Gly	Val	Ala
		100						105				110			
Met	Pro	Thr	Ser	Pro	Ile	Ser	Asp	Gly	Arg	Arg	Asp	Asp	Leu	Tyr	Ala
		115				120						125			
Cys	Val	Val	Ser	Leu	Ala	Glu	Gln	Ala	Gly	Thr	Tyr	Thr	Val	Ser	Asp
130						135				140					
Tyr	Cys	Ser	Ile	Val	Glu	His	Leu	Val	Arg	Glu	Trp	Arg	Val	Glu	Glu
145				150						155				160	
Leu	Ala	Ala	Gly	Leu	Ser	Gly	Glu	Gly	Arg	Arg	Ala	Arg	Asp	Tyr	Val
				165				170						175	
Cys	Glu	Leu	Pro	Gln	Lys	Ile	Arg	Arg	Met	Lys	Glu	Lys	Ala	His	Glu
		180						185				190			
Arg	Ala	Val	Lys	Ala	Gln	Lys	Lys	Pro	Ile	Ser	Ile	Pro	Ile	Asn	Trp
		195				200						205			
Ile	Phe	Asp	Arg	His	Val	Ser	Val	Met	Leu	Pro					
210						215									

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<210> 15
<211> 1318
<212> DNA
<213> Oryza sativa
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actcgatgcc	gccggagaag	gcggaggtgt	tccggtcgct	ggaaggggtg	gcgaggtcgt		240
cgctgctgcc	gctgctcaag	cccgtggagg	agtgctggca	gccgcaggac	tctctgcgg		300
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tccccgacga	gtacttcgtc	gtgctggtcg	gggacatgat	taccgaggag	gcgctgccga		420
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tgtcttgggtt gaattctgaa ttccagtc tagatgatca tgccatttcg ttatcatctc 1260
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<210> 16
 <211> 381
 <212> PRT
 <213> Oryza sativa

<400> 16
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 Ala Pro Ser Arg Arg Gln Cys Arg Val Ser Ala Ala Val Leu Thr Ala
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 Ala Glu Thr Ala Thr Ala Thr Arg Arg Arg Val Thr His Ser Met Pro
 35 40 45
 Pro Glu Lys Ala Glu Val Phe Arg Ser Leu Glu Gly Trp Ala Arg Ser
 50 55 60
 Ser Leu Leu Pro Leu Leu Lys Pro Val Glu Glu Cys Trp Gln Pro Thr
 65 70 75 80
 Asp Phe Leu Pro Asp Ser Ser Ser Glu Met Phe Glu His Gln Val His
 85 90 95
 Glu Leu Arg Ala Arg Ala Ala Gly Leu Pro Asp Glu Tyr Phe Val Val
 100 105 110
 Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr Gln Thr
 115 120 125
 Met Ile Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala Ser Ala
 130 135 140
 Cys Pro Trp Ala Val Trp Thr Arg Thr Trp Thr Ala Glu Glu Asn Arg
 145 150 155 160
 His Gly Asp Ile Leu Gly Lys Tyr Met Tyr Leu Ser Gly Arg Val Asp
 165 170 175
 Met Arg Met Val Glu Lys Thr Val Gln Tyr Leu Ile Gly Ser Gly Met
 180 185 190
 Asp Pro Gly Thr Glu Asn Asn Pro Tyr Leu Gly Phe Val Tyr Thr Ser
 195 200 205
 Phe Gln Glu Arg Ala Thr Ala Val Ser His Gly Asn Thr Ala Arg Leu
 210 215 220
 Ala Arg Ala His Gly Asp Asp Val Leu Ala Arg Thr Cys Gly Thr Ile
 225 230 235 240
 Ala Ala Asp Glu Lys Arg His Glu Thr Ala Tyr Gly Arg Ile Val Glu
 245 250 255
 Gln Leu Leu Arg Leu Asp Pro Asp Gly Ala Met Leu Ala Ile Ala Asp
 260 265 270

Met Met His Lys Arg Ile Thr Met Pro Ala His Leu Met His Asp Gly
 275 280 285
 Arg Asp Met Asn Leu Phe Asp His Phe Ala Ala Val Ala Gln Arg Leu
 290 295 300
 Asn Val Tyr Thr Ala Arg Asp Tyr Ala Asp Ile Val Glu Phe Leu Val
 305 310 315 320
 Lys Arg Trp Lys Leu Glu Thr Leu Glu Thr Gly Leu Ser Gly Glu Gly
 325 330 335
 Arg Arg Ala Arg Asp Phe Val Cys Gly Leu Ala Lys Arg Met Arg Arg
 340 345 350
 Ala Ala Glu Arg Ala Glu Asp Arg Ala Lys Lys Asp Glu Gln Arg Lys
 355 360 365
 Val Lys Phe Ser Trp Ile Tyr Asp Arg Glu Val Ile Val
 370 375 380

 <210> 17
 <211> 384
 <212> PRT
 <213> *Lupinus luteus*

 <400> 17
 Met Gln Ile Gln Thr Cys Tyr Ser Ile Arg Ile Gln Ile Leu Pro Leu
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 Pro Trp Ala Arg Arg Thr Gly Arg His Lys Met Leu Pro Pro Ile Ala
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 Ala Ile Ser Ala Thr Pro Pro Ser Leu Lys Ser Pro Lys Thr His Ser
 35 40 45
 Met Pro Pro Glu Lys Ile Glu Ile Phe Lys Ser Leu Glu Ser Trp Ala
 50 55 60
 Ser Gln Ser Val Leu Pro Leu Leu Lys Pro Val Glu Gln Cys Trp Gln
 65 70 75 80
 Pro Gln Glu Phe Val Pro Asp Ser Ser Leu Pro Phe Gly Asp Phe Thr
 85 90 95
 Asp Gln Val Lys Ala Leu Arg Asp Arg Thr Ala Glu Leu Pro Glu Glu
 100 105 110
 Tyr Phe Val Val Leu Val Gly Asp Met Ile Thr Glu Asp Ala Leu Pro
 115 120 125
 Thr Tyr Gln Ser Met Ile Asn Asn Leu Asp Gly Val Arg Asp Glu Thr
 130 135 140
 Gly Ser Ser Pro Ser Pro Trp Ala Leu Trp Thr Arg Ala Trp Thr Ala
 145 150 155 160

Glu Glu Lys Arg His Gly Asp Leu Leu Arg Thr Tyr Leu Tyr Leu Ser
165 170 175

Gly Arg Val Asp Met Lys Lys Ile Glu Lys Thr Val Gln Tyr Leu Ile
180 185 190

Gly Ser Gly Met Asp Pro Gly Thr Glu Asn Asn Pro Tyr Leu Gly Phe
195 200 205

Val Tyr Thr Ser Phe Gln Glu Arg Ala Thr Phe Val Ser His Gly Asn
210 215 220

Thr Ala Arg Leu Ala Lys Glu Gly Gly Asp Pro Val Leu Ala Arg Ile
225 230 235 240

Cys Gly Thr Ile Ala Ala Asp Glu Lys Arg His Glu Asn Ala Tyr Ser
245 250 255

Arg Ile Val Glu Lys Leu Leu Glu Leu Asp Pro Thr Gly Ala Met Val
260 265 270

Ala Ile Gly Asp Met Met Gln Lys Lys Ile Thr Met Pro Ala His Leu
275 280 285

Met Tyr Asp Gly Glu Asp Pro Lys Leu Phe Asp His Phe Ser Ala Val
290 295 300

Ala Gln Arg Met Gly Val Tyr Thr Ala Asn Asp Tyr Ala Asp Ile Leu
305 310 315 320

Glu Phe Leu Ile Gly Arg Trp Arg Leu Glu Lys Val Gln Asp Leu Lys
325 330 335

Asp Glu Gly Lys Lys Ala Gln Asp Phe Val Cys Gly Leu Ala Pro Arg
340 345 350

Ile Arg Arg Leu Gln Glu Arg Ala Asp Glu Arg Ala Arg Lys Met Lys
355 360 365

Pro His Ala Val Lys Phe Ser Trp Ile Phe Asn Lys Glu Ile Ile Leu
370 375 380

<210> 18
<211> 396
<212> PRT
<213> Cucumis sativus

<400> 18
Met Ala Leu Lys Phe His Pro Leu Thr Ser Gln Ser Pro Lys Leu Pro
1 5 10 15

Ser Phe Arg Met Pro Gln Leu Ala Ser Leu Arg Ser Pro Lys Phe Val
20 25 30

Met Ala Ser Thr Leu Arg Ser Thr Ser Arg Glu Val Glu Thr Leu Lys
35 40 45

Lys Pro Phe Met Pro Pro Arg Glu Val His Leu Gln Val Thr His Ser
50 55 60

Met	Pro	Pro	Gln	Lys	Met	Glu	Ile	Phe	Lys	Ser	Leu	Glu	Asp	Trp	Ala	65	70	75	80
Glu	Glu	Asn	Leu	Leu	Val	His	Leu	Lys	Pro	Val	Glu	Arg	Cys	Trp	Gln	85	90	95	
Pro	Gln	Asp	Phe	Leu	Pro	Asp	Ser	Ala	Phe	Glu	Gly	Phe	His	Glu	Gln	100	105	110	
Val	Arg	Glu	Leu	Arg	Glu	Arg	Ala	Lys	Glu	Leu	Pro	Asp	Glu	Tyr	Phe	115	120	125	
Val	Val	Leu	Val	Gly	Asp	Met	Ile	Thr	Glu	Glu	Ala	Leu	Pro	Thr	Tyr	130	135	140	
Gln	Thr	Met	Leu	Asn	Thr	Leu	Asp	Gly	Val	Arg	Asp	Glu	Thr	Gly	Ala	145	150	155	160
Ser	Pro	Thr	Pro	Trp	Ala	Ile	Trp	Thr	Arg	Ala	Trp	Thr	Ala	Glu	Glu	165	170	175	
Asn	Arg	His	Gly	Asp	Leu	Leu	Asn	Lys	Tyr	Leu	Tyr	Leu	Ser	Gly	Arg	180	185	190	
Val	Asp	Met	Arg	Gln	Val	Glu	Lys	Thr	Ile	Gln	Tyr	Leu	Ile	Gly	Ser	195	200	205	
Gly	Met	Asp	Pro	Arg	Thr	Glu	Asn	Asn	Pro	Tyr	Leu	Gly	Phe	Ile	Tyr	210	215	220	
Thr	Ser	Phe	Gln	Glu	Arg	Ala	Thr	Phe	Ile	Ser	His	Gly	Asn	Thr	Ala	225	230	235	240
Arg	Leu	Ala	Lys	Glu	His	Gly	Asp	Ile	Lys	Leu	Ala	Gln	Ile	Cys	Gly	245	250	255	
Thr	Ile	Thr	Ala	Asp	Glu	Lys	Arg	His	Glu	Thr	Ala	Tyr	Thr	Lys	Ile	260	265	270	
Val	Glu	Lys	Leu	Phe	Glu	Ile	Asp	Pro	Glu	Gly	Thr	Val	Ile	Ala	Phe	275	280	285	
Glu	Glu	Met	Met	Arg	Lys	Lys	Val	Ser	Met	Pro	Ala	His	Leu	Met	Tyr	290	295	300	
Asp	Gly	Arg	Asp	Asp	Asn	Leu	Phe	His	His	Phe	Ser	Ala	Val	Ala	Gln	305	310	315	320
Arg	Leu	Gly	Val	Tyr	Thr	Ala	Lys	Asp	Tyr	Ala	Asp	Ile	Leu	Glu	Phe	325	330	335	
Leu	Val	Gly	Arg	Trp	Lys	Val	Glu	Ser	Leu	Thr	Gly	Leu	Ser	Gly	Glu	340	345	350	
Gly	Gln	Lys	Ala	Gln	Asp	Tyr	Val	Cys	Ala	Leu	Pro	Ala	Arg	Ile	Arg	355	360	365	
Lys	Leu	Glu	Glu	Arg	Ala	Gln	Gly	Arg	Ala	Lys	Glu	Gly	Pro	Thr	Ile	370	375	380	

[illegible]

<400> 19

Glu Asn Ala Tyr Val Arg Ile Val Glu Lys Leu Leu Glu Ile Asp Pro
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Asn Gly Ala Val Ser Ala Val Ala Asp Met Met Arg Lys Lys Ile Thr
 260 265 270
 Met Pro Ala His Leu Met Thr Asp Gly Arg Asp Pro Met Leu Phe Glu
 275 280 285
 His Phe Ser Ala Val Ala Gln Arg Leu Glu Val Tyr Thr Ala Asp Asp
 290 295 300
 Tyr Ala Asp Ile Leu Glu Phe Leu Val Gly Arg Trp Arg Leu Glu Lys
 305 310 315 320
 Leu Glu Gly Leu Thr Gly Glu Gly Gln Arg Ala Gln Glu Phe Val Cys
 325 330 335
 Gly Leu Ala Gln Arg Ile Arg Arg Leu Gln Glu Arg Ala Asp Glu Arg
 340 345 350
 Ala Lys Lys Leu Lys Lys Thr His Glu Val Cys Phe Ser Trp Ile Phe
 355 360 365
 Asp Lys Gln Ile Ser Val
 370

<210> 20
 <211> 398
 <212> PRT
 <213> Simmondsia chinensis

<400> 20
 Met Ala Leu Lys Leu His His Thr Ala Phe Asn Pro Ser Met Ala Val
 1 5 10 15
 Thr Ser Ser Gly Leu Pro Arg Ser Tyr His Leu Arg Ser His Arg Val
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 Phe Met Ala Ser Ser Thr Ile Gly Ile Thr Ser Lys Glu Ile Pro Asn
 35 40 45
 Ala Lys Lys Pro His Met Pro Pro Arg Glu Ala His Val Gln Lys Thr
 50 55 60
 His Ser Met Pro Pro Gln Lys Ile Glu Ile Phe Lys Ser Leu Glu Gly
 65 70 75 80
 Trp Ala Glu Glu Asn Val Leu Val His Leu Lys Pro Val Glu Lys Cys
 85 90 95
 Trp Gln Pro Gln Asp Phe Leu Pro Asp Pro Ala Ser Glu Gly Phe Met
 100 105 110
 Asp Gln Val Lys Glu Leu Arg Glu Arg Thr Lys Glu Ile Pro Asp Glu
 115 120 125
 Tyr Leu Val Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro
 130 135 140
 Thr Tyr Gln Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr
 145 150 155 160

Val Glu Lys Leu Gly Met Gly Leu Ser Gly Glu Gly Arg Arg Ala Gln
 355 360 365

Asp Tyr Leu Cys Thr Leu Pro Gln Arg Ile Arg Arg Leu Glu Glu Arg
 370 375 380

Ala Asn Asp Arg Val Lys Leu Ala Ser Lys Ser Lys Pro Ser Val Ser
 385 390 395 400

Phe Ser Trp Ile Tyr Gly Arg Glu Val Glu Leu
 405 410

<210> 22
 <211> 396
 <212> PRT
 <213> Linum usitatissimum

<400> 22
 Met Ala Leu Lys Leu Asn Pro Val Thr Thr Phe Pro Ser Thr Arg Ser
 1 5 10 15

Leu Asn Asn Phe Ser Ser Arg Ser Pro Arg Thr Phe Leu Met Ala Ala
 20 25 30

Ser Thr Phe Asn Ser Thr Ser Thr Lys Glu Ala Glu Lys Leu Lys Lys
 35 40 45

Ser His Gly Pro Pro Lys Glu Val His Met Gln Val Thr His Ser Met
 50 55 60

Pro Pro Gln Lys Leu Glu Ile Phe Lys Ser Leu Glu Gly Trp Ala Glu
 65 70 75 80

Asp Val Leu Leu Pro His Leu Lys Pro Val Glu Lys Cys Trp Gln Pro
 85 90 95

Gln Asp Phe Leu Pro Glu Pro Glu Ser Asp Gly Phe Glu Glu Gln Val
 100 105 110

Lys Glu Leu Arg Ala Arg Ala Lys Glu Leu Pro Asp Asp Tyr Phe Val
 115 120 125

Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr Gln
 130 135 140

Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala Ser
 145 150 155 160

Leu Thr Pro Trp Ala Ile Trp Thr Arg Ala Trp Thr Ala Glu Glu Asn
 165 170 175

Arg His Gly Asp Leu Leu Asn Lys Tyr Leu Tyr Leu Ser Gly Arg Val
 180 185 190

Asp Met Arg Gln Ile Glu Lys Thr Ile Gln Tyr Leu Ile Gly Ser Gly
 195 200 205

Met Asp Pro Lys Thr Glu Asn Asn Pro Tyr Leu Gly Phe Ile Tyr Thr
 210 215 220

Pro	Asp	Pro	Ser 100	Ser	Asp	Gly	Phe	Glu 105	Glu	Gln	Val	Lys	Glu 110	Leu	Arg
Glu	Arg	Ala 115	Lys	Glu	Ile	Pro	Asp 120	Asp	Tyr	Phe	Val	Val 125	Leu	Val	Gly
Asp	Met 130	Ile	Thr	Glu	Glu	Ala 135	Leu	Pro	Thr	Tyr	Gln 140	Thr	Met	Leu	Asn
Thr 145	Leu	Asp	Gly	Val	Arg 150	Asp	Glu	Thr	Gly	Ala 155	Ser	Leu	Thr	Ser	Trp 160
Ala	Ile	Trp	Thr	Arg 165	Ala	Trp	Thr	Ala	Glu 170	Glu	Asn	Arg	His	Gly 175	Asp
Leu	Leu	Asn	Lys 180	Tyr	Leu	Tyr	Leu	Ser 185	Gly	Arg	Val	Asp 190	Met	Lys	Gln
Ile	Glu	Lys 195	Thr	Ile	Gln	Tyr	Leu 200	Ile	Gly	Ser	Gly	Met 205	Asp	Pro	Arg
Thr	Glu 210	Asn	Ser	Pro	Tyr	Leu 215	Gly	Phe	Ile	Tyr	Thr 220	Ser	Phe	Gln	Glu
Arg 225	Ala	Thr	Phe	Ile	Ser 230	His	Gly	Asn	Thr	Ala 235	Arg	Leu	Ala	Lys	Glu 240
His	Gly	Asp	Ile	Lys 245	Leu	Ala	Gln	Ile	Cys 250	Gly	Met	Ile	Ala	Ser 255	Asp
Glu	Lys	Arg	His 260	Glu	Thr	Ala	Tyr	Thr 265	Lys	Ile	Val	Glu 270	Lys	Leu	Phe
Glu	Val	Asp 275	Pro	Asp	Gly	Thr	Val 280	Met	ala	Phe	Ala	Asp 285	Met	Met	Arg
Lys	Lys 290	Ile	Ala	Met	Pro	Ala 295	His	Leu	Met	Tyr	Asp 300	Gly	Arg	Asp	Asp
Asn 305	Leu	Phe	Asp	Asn	Tyr 310	Ser	Ala	Val	Ala	Gln 315	Arg	Ile	Gly	Val	Tyr 320
Thr	Ala	Lys	Asp	Tyr 325	Ala	Asp	Ile	Leu	Glu 330	Phe	Leu	Val	Gly	Arg 335	Trp
Lys	Val	Glu	Gln 340	Leu	Thr	Gly	Leu	Ser 345	Gly	Glu	Gly	Arg	Lys 350	Ala	Gln
Glu	Tyr	Val 355	Cys	Gly	Leu	Pro	Pro 360	Arg	Ile	Arg	Arg	Leu 365	Glu	Glu	Arg
Ala	Gln 370	Ala	Arg	Gly	Lys	Glu 375	Ser	Ser	Thr	Leu	Lys 380	Phe	Ser	Trp	Ile
His 385	Asp	Arg	Glu	Val	Leu 390	Leu									

$\langle 210 \rangle$	24
$\langle 211 \rangle$	80

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ctttattaac	aagattttgt	ttttgtttga	tgacgttttt	taatgtttac	gctttccccc	4680
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tcataataaa	taaacacaa	atttttaaat	aatctgaaat	aataatgaac	aatattacat	4800

